III. CLAIM AMENDMENTS

1. (Currently Amended) A solid state single mode distributed feedback (DFB) laser ~~(1)~~, comprising:

a laser waveguide ~~(10)~~;

a DFB grating structure ~~(6)~~ optically coupled to the waveguide ~~(10)~~ for stabilising the wavelength of optical radiation ~~(7)~~ in the waveguide ~~(10)~~;

one or more current conduction regions ~~(4', 4")~~ for guiding an applied electrical current to pump the laser waveguide ~~(10)~~; and

at least one current constriction region ~~(40)~~ adjacent said one or more current conduction regions ~~(4', 4")~~, said DFB structure ~~(6)~~ extending in said current constriction region ~~(40)~~ and at least one of said current conduction regions ~~(4', 4")~~, wherein the current conduction and constriction regions ~~(4', 4", 40)~~ are arranged so that an electrical current ~~(34)~~ applied to the current conduction region(s) ~~(4', 4")~~ pumps the laser waveguide ~~(10)~~ preferentially in said one or more current conduction regions ~~(4', 4")~~ compared with the electrical constriction region ~~(40)~~ and thus varies the effective index of refraction ~~(38)~~ of the laser waveguide ~~(10)~~ in said regions ~~(4', 4", 40)~~ in order to stabilise said optical radiation ~~(7)~~ for single mode operation of the laser ~~(1)~~.

2. (Currently Amended) A DFB laser ~~(1)~~ as claimed in Claim 1, in which the DFB structure ~~(6)~~ is based on a

regular periodic array of partially reflective features.

3. (Currently Amended) A DFB laser ~~(1)~~ as claimed in Claim 1 ~~or Claim 2~~, in which the current constriction region ~~(40)~~ is ion implanted to increase the electrical resistivity of the current constriction region ~~(40)~~ relative to said adjacent current conduction region ~~(4',4")~~.

4. (Currently Amended) A DFB laser ~~(1)~~ as claimed in Claim 1 ~~or Claim 2~~, in which the current conduction region ~~(4',4")~~ is formed from one or more semiconductor layers ~~(12,24,26)~~ deposited above the laser waveguide ~~(10)~~, at least one of said deposited layers ~~(26)~~ not extending over the current constriction region ~~(40)~~.

5. (Currently Amended) A DFB laser ~~(1)~~ as claimed in ~~any preceding claim~~claim 1, including one or more electrical contacts ~~(30',30")~~ for applying said electrical current ~~(34)~~, in which said one or more contacts ~~(30',30")~~ extend over the current conduction regions ~~(4',4")~~ but not over said current constriction region ~~(40)~~.

6. (Currently Amended) A DFB laser ~~(1)~~ as claimed in ~~any preceding claim~~claim 1, in which one current constriction region ~~(40)~~ lies between two adjacent current conduction regions ~~(4',4")~~.

7. (Currently Amended) A DFB laser ~~(1)~~ as claimed in ~~Claim 6 when appendant from~~ Claim 511, in which both of said two adjacent current conduction regions ~~(4',4")~~ have an electrical contact ~~(30',30")~~ for applying said current ~~(34)~~.

8. (Currently Amended) A DFB laser ~~(1)~~ as claimed in Claim 7, in which said two electrical contacts ~~(30',30")~~ are in direct electrical connection.

9. (Currently Amended) A method of forming a solid state single mode distributed feedback (DFB) laser ~~(1)~~, said laser having a semiconductor substrate ~~(2)~~ and a plurality of layers ~~(8,10,12,17,18,19,24,26)~~ deposited above said substrate, the method comprising ~~the steps of~~ :

forming in said deposited layers:

a) a laser waveguide ~~(10)~~;

b) one or more current conduction regions ~~(4',4")~~ above said laser waveguide ~~(10)~~ for guiding an applied electrical current ~~(34)~~ to pump the laser waveguide ~~(10)~~;

c) at least one current constriction region ~~(40)~~ above said laser waveguide ~~(10)~~ and adjacent said one or more current conduction regions ~~(4',4")~~; and

d) a DFB grating structure ~~(6)~~ optically coupled to the waveguide ~~(10)~~ for stabilising the wavelength of optical radiation ~~(7)~~ in said waveguide ~~(10)~~, said structure extending in said current constriction region ~~(40)~~ and at least one of said current conduction regions ~~(4',4");~~,

wherein said one or more current conduction regions ~~(4',4")~~ and said at least one current constriction region ~~(40)~~ have the characteristic that electrical current ~~(34)~~ applied to said

current conduction region(s) pumps the laser waveguide ~~(10)~~ preferentially in said one or more current conduction regions ~~(4′,4″)~~ compared with said at least one electrical constriction region ~~(40)~~ in order to vary the effective index of refraction ~~(38)~~ of the laser waveguide ~~(10)~~ in said regions ~~(4′,4″,40)~~ in order to stabilise said optical radiation ~~(7)~~ for single mode operation of the laser ~~(1)~~.

10. (Currently Amended) A method of operating a solid state distributed feedback (DFB) laser ~~(1)~~, said laser having a laser waveguide ~~(10)~~, a DFB grating structure ~~(6)~~ optically coupled to the waveguide ~~(10)~~ for stabilising the wavelength of optical radiation ~~(7)~~ in the waveguide ~~(10)~~, one or more current conduction regions ~~(4′,4″)~~ for guiding an applied electrical current ~~(34)~~ to pump the laser ~~(1)~~, the current conduction region(s) ~~(4′,4″)~~ extending only within a portion of the DFB grating structure ~~(6)~~, wherein the method comprises:

applying through said one or more current conduction regions ~~(4′,4″)~~ an electrical current ~~(34)~~ to pump the laser waveguide ~~(10)~~ unevenly with respect to the extent of the DFB structure ~~(6)~~ and thus vary the effective index of refraction ~~(38)~~ of the laser waveguide ~~(10)~~ in order to stabilise said optical radiation ~~(7)~~ for single mode operation of the laser ~~(1)~~.

11. (New) The DFB laser of claim 5, wherein one current constriction region lies between two adjacent current conduction regions.